# Political Competition, Policy and Growth: Theory and Evidence from the United States*

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**Abstract**

This paper develops a simple model to analyze how lack of political competition may lead to policies that hinder economic growth. We test the predictions of the model exploiting variation in political competition across US states. We find robust evidence that lack of political competition in a state is associated with anti-growth policies: higher taxes, lower capital spending and less likely use of right-to-work laws. We also document a strong link between low political competition and low income growth.

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# 1 Introduction

One of the most cherished propositions in economics is that, by and large, monopoly is bad and market competition between firms raises the welfare of consumers. Whether competition between political parties has similarly virtuous consequences is far less discussed,[1] despite the long-term monopoly on power by a dominant party observed in a number of existing democracies.[2] Moreover, few empirical studies speak to the question of whether political competition matters for economic outcomes.[3]

This paper develops a simple theoretical model to think through these issues. Our theory guides both the measurement of political competition and the empirical approach that we take. The key prediction of the model is that political competition forces parties to implement growth promoting policies rather than special interest policies. The underlying mechanism is that swing voters, whose voting decision in based on parties' economic policy choices, only start to gain electoral influence if political competition exceeds a critical threshold.

Our empirical application exploits the substantial variation in political competition across U.S. states to explore the relationship between political competition, economic policy, and economic performance. Figure 1 illustrates some of the variation in our main measure of political competition – detailed below – which uses a data set originating in the work of Ansolabehere and Snyder (2002). This figure displays ten year averages of our measure of political competition for the four main census regions. The most striking deviation from competitive elections visible in the figure is the well-known decline in political competition in the US south after the 1880s that lasts until the 1960s. In our empirical work, we exploit the variation between different regions of the US, as well as the substantial variation in political competition within each region.

[1] The Chicago School of political economy makes a strong argument as to the efficiency of political competition (Stigler, 1972, and Wittman, 1989, 1995), but has not studied the detailed institutional underpinnings of this argument. Polo (1998) and Svensson (1998) provide early formal analyses of how lopsided political competition may lead to excessive rent-seeking or inefficient provision of government services.

[2] A large literature in political science discusses the dominant-party systems in countries such as Japan (the LDP), Malaysia (the UMNO), Mexico (the IRP), Paraguay (the Colorado Party), and South Africa (the ANC), focusing on their political effects (see e.g., the contributions in Pempel, 1990).

[3] Besley and Case (2003) discusses some evidence from studies using U.S. data.

A consistent picture emerges. Higher political competition is associated with a change in the policy mix towards policies that are widely believed to be pro-business and growth promoting – lower tax revenue as a share of income, higher capital spending as a share of total state spending and the presence of right-to-work laws. These results are robust across a number of specifications. First, we show that our results hold up in the US south or the US north separately. Second, we control for which party controls the state legislature and governorship. While the party control variables have the expected sign, the effect of political competition on policy choices remains virtually unchanged. Third, we demonstrate that the effect of political competition on policy choices is non-linear as suggested by the theoretical model. At very low and very high levels of political competition, changes in political competition have smaller impacts on policy compared to intermediate levels of political competition. Finally, our results are also robust when we instrument for political competition to meet concerns about potential reverse causation from policy choices to the degree of political competition.

We then investigate whether these changes in economic policy are reflected in overall state economic performance. To this end, we estimate reduced form growth regressions with our measure of political competition as an explanatory variable. We find that over the period after 1929 (from when official state personal income estimates are available), political competition is strongly associated with higher economic growth rates. This finding is again robust to controlling for which party holds the state legislature and governorship and to instrumenting for political competition. Finally, we obtain very similar results using the Easterlin (1960) estimates of state personal income for the years 1880, 1900 and 1920. These lend further credence to the conclusion that the association between political competition and growth is not peculiar to the period from 1929 onwards. Taken together, our results provide strong evidence that political competition benefits economic development by inducing political parties to pursue growth promoting policies rather than their private agendas.

The remainder of the paper is organized as follows. Section 2 develops the theoretical model. Section 3 discusses some background to the history of political competition in the United States. Section 4 presents our empirical strategy and results and Section 5 concludes.

# 2 Theory

Our model illustrates how political competition can affect policy and economic growth. Two parties compete by picking electoral platforms. To fix ideas, we focus on a single policy which distorts economic decisions and lowers overall income, but transfers resources to one group of citizens. Lack of political competition is defined as an electoral advantage of one of two political parties. This advantage arises from a surplus of committed voters, due to the parties' non-pliable stance on a non-economic issue. The electoral advantage gives a dominant party less incentive to appeal to swing voters, who are not committed to one party and are prepared to vote against candidates pursuing distorted policies.

At a first stage in the model, each of the parties picks a policy platform under uncertainty about a popularity shock. Second, this shock is realized as voters cast their ballot. Finally, private economic choices are made in the light of realized policy. The next subsections deal with these choices in reverse order.

## 2.1 The Economic Model

We use a reduced-form model of economic decisions.[4] There are two time periods and a (size one) continuum of citizens, each of whom invests one unit of capital. The first-period return is normalized at unity, while the second-period return is $q(\tau) \geq 1$ where $\tau \in [0, 1]$ is an economic policy. We assume that $q_\tau(\tau) < 0$, so an increase in $\tau$ reduces second period income. However, the policy also creates benefits to a fraction $\alpha < 1$ of the citizens, who receive a rent of $r(\tau)$, where $r(0) = 0$ and $r$ is an increasing function. Using the policy $\tau$ to redistribute income reduces overall surplus, but creates a net benefit for the recipients of the rent $r$, which implies that

$$\frac{r_\tau(\tau)}{\alpha} > -q_\tau(\tau) > r_\tau(\tau) > 0 \ .$$

This assumption creates a conflict of interest over policy in a very simple way: it is optimal for the group that benefits from the policy to set $\tau = 1$,

[4] In a previous version of the paper (Besley, Persson and Sturm, 2006), the model was given micro-foundations, along the lines in Persson and Tabellini (2000, Section 14.3). This extended model has two sectors – one traditional, one new – and two time periods. It pivots around quasi-rents earned by owners of traditional factors, and their incentives to protect these rents at the expense of economic growth.

but average income per capita is higher when $\tau = 0$. The growth rate of the economy

$$G(\tau) = q(\tau) + r(\tau) - 1 \tag{1}$$

is a decreasing function of $\tau$, i.e., growth is higher when $\tau$ is closer to zero.

## 2.2 The Political Model

There are three types of voters: Democrats, Republicans and independents, denoted by $P \in \{D, R, 0\}$. Partisan voters (Democrats and Republicans) make up a fraction $1-\sigma$ of the population. Only Democrats and Republicans are organized in parties, which are denoted by $p \in \{D, R\}$. Let $\delta(P, p)\Delta$ be the utility gain of a partisan voter $P$ from having her preferred political party $p$ in office. We assume that $\delta(D, R) = \delta(R, D) = 0$ and $\delta(R, R) = \delta(D, D) = 1$.

We assume that the partisan types $D$ and $R$ prefer their respective party due to non-economic issues, i.e., their utility gain $\Delta$ dominates any economic concern. Of these committed voters, a fraction $(1 + \lambda)/2$ prefers party $D$. For example, in an application to the US south, $\Delta$ could be the electoral salience of race. The sign of $\lambda$ can be positive or negative, but to fix ideas in the model presentation we let the Democrats have the edge among committed voters ($\lambda > 0$).

Independent voters ($P = 0$) vote primarily on economic issues and become swing voters. Specifically, their economic payoff of having party $p$ in office depends on the policy choice $\tau_p$ of this party and is $v_p = q(\tau_p)$. Independents also care about the sheer identity of parties, but less so than partisans. Their political payoff is $\omega$, for or against party $D$'s stance on non-economic issues, with $\omega \lesseqgtr 0$ distributed among the voters. Thus, a swing voter casts her ballot for party $D$ whenever:

$$\eta + \omega + v_D - v_R > 0 \ ,$$

where $\eta$ is an aggregate popularity shock in favor or the Democratic party. We assume that $\omega$ is uniform on $\left[-\frac{1}{2\phi}, \frac{1}{2\phi}\right]$, with $\frac{1}{2\phi} < \Delta$.

Under this parametrization, the condition for Democratic electoral victory is (assuming an interior solution):

$$\sigma\phi\left[v_D - v_R + \eta\right] + (1 - \sigma)\lambda/2 > 0 \ .$$

This condition can be rewritten as $\eta > \kappa - (v_D - v_R)$, where

$$\kappa = -\frac{1-\sigma}{\sigma} \cdot \frac{\lambda}{\phi 2}$$

is our indicator of the state of political competition, the measurement of which we return to in Section 3.

We assume that parties compete by committing themselves to policy platforms $\{\tau_D, \tau_R\}$. Moreover, when parties pick their platforms, they know the distributions of $\omega$ and $\eta$, but not the realization of $\eta$. To further simplify the algebra, let $\eta$ be uniform on $\left[-\frac{1}{2\xi}, \frac{1}{2\xi}\right]$. In this case the probability of a Democratic win simplifies to:

$$P_D(v_D - v_R - \kappa) = \begin{cases} 1 \quad \text{if} \;\; \xi\left[v_D - v_R - \kappa\right] \geq \frac{1}{2} \\ \frac{1}{2} + \xi\left[v_D - v_R - \kappa\right] \\ 0 \;\; \text{if} \;\; \xi\left[v_D - v_R - \kappa\right] \leq -\frac{1}{2} \;. \end{cases} \tag{2}$$

Evidently, the model predicts the Democrats' electoral success to depend on two factors, namely the (endogenous) utility difference $v_D - v_R$, and the (exogenous) electoral advantage parameter $\kappa$.

The model gives insight into the factors that make political competition stiffer, which corresponds to values of $\kappa$ closer to zero. Political competition increases as $\lambda$ approaches zero, i.e., when the advantage of either the Democratic or Republican party among partisan voters declines. Political competition is also stiffer when $\sigma$ is large – swing voters make up a larger fraction of the voting population. Lower salience of non-economic issues among the swing voters – a higher $\phi$ – also raises political competition, as does a more ideologically neutral set of swing voters.[5]

For simplicity we assume that all policy rents $r(\tau)$ accrue to the winning party, which makes up a share $\alpha$ of the population. While extreme, this assumption clearly illustrates why parties may wish to implement anti-growth policies.[6] Average utility of a party member is $r(\tau)/\alpha + q(\tau)$. To map

[5] Our assumption that $\omega$ is uniformly distributed is made for analytical convenience. If instead $\omega$ had a smooth unimodal distribution, a shift of the mass in this distribution towards the middle would raise the p.d.f. $g_\omega$ in that range. An increase in the density $\phi$ of our assumed uniform can be thought of as approximating such a shift towards a more ideologically neutral electorate.

[6] In Besley, Persson and Sturm (2006), we showed how such a motive may arise indirectly, due to lobbying of the incumbent party by a group of vested interests in the population.

the rents into swing-voter utility, define $T(v) = [r(q^{-1}(v))]/\alpha$ as the rents enjoyed by the party when the swing voters' utility is $v$. ($T$ is a decreasing function). Let $\bar{v}$ be the swing voters' preferred utility level (with $T(\bar{v}) = 0$) and let $1 + T_v(\underline{v}) = 0$ define the level of swing-voter utility that maximizes party utility with $q^{-1}(\underline{v}) \in (0, 1)$.

Electoral competition can now be modeled as parties choosing $\{v_D, v_R\}$ rather than the underlying policy choices $\{\tau_D, \tau_R\}$. The expected payoff of the Democratic party is:

$$v_R + P_D(v_D - v_R - \kappa)[\Delta + T(v_D) + v_D - v_R] \ , \qquad (3)$$

while the Republican party payoff is:

$$\Delta + T(v_R) + v_R - P_D(v_D - v_R - \kappa)[\Delta + T(v_R) + v_R - v_D] \ . \qquad (4)$$

The interesting difference between these payoffs is captured by $\kappa$, our measures of political competition. As we will see, because $\kappa < 0$ the Democrats (more generally, the party with an electoral advantage) are less pro-growth. The trade-off facing parties is quite simple: offering a higher utility to swing voters increases a party's chance of winning, but reduces the rents ($T$) captured if winning.

## 2.3 Equilibrium

What does our model predict about the effects of political competition, as measured by $\kappa$? Formally, we can represent an equilibrium of the model by a pair of utility levels $\{v_D, v_R\} \in [\underline{v}, \overline{v}]$, which forms a Nash equilibrium in the pre-election game between the two parties, given the equilibrium behavior of voters. As above, we focus on the case where $\kappa < 0$, i.e., the electorate is biased towards the Democrats.

We study an equilibrium where two assumptions hold:

**Assumption 1**

$$2 + T_v(\bar{v}) < 0 \ ,$$

the party reaction functions slope upwards in a neighborhood of $\overline{v}$, and

**Assumption 2**

$$\frac{(1 + T_v(\bar{v}))}{2} + \xi\Delta < 0 \ ,$$

the party's marginal cost of foregone rents exceeds the marginal benefit of ideological stance, at the point of undistorted policy. Under these conditions, dominant parties will tend to pick an outcome where $v_p < \overline{v}$. Note that Assumptions 1 and 2 hold if $\alpha$ is close enough to zero, i.e. rents are sufficiently concentrated.

The key result linking policy and political competition (proof in the Theory Appendix) is:

**Proposition 1** *If Assumptions 1 and 2 hold, an equilibrium exists and the effect of political competition on economic outcomes has three ranges:*

1. *For $\kappa$ below a lower threshold ($\kappa_L$) the Democrats pursue their own preferred (anti-growth) policy and win for sure.*

2. *For $\kappa$ in an intermediate range below a higher threshold ($\kappa_H$), the Republicans pick more pro-growth policies than the Democrats. As competition increases, the probability that the Republicans win increases and the Democrats move towards pro-growth policies.*

3. *For $\kappa$ close enough to zero, the party ranking and the effect of political competition on policy and economic growth are ambiguous.*

These results give way naturally to an empirical approach. First, the model guides our measurement of the key parameter $\kappa$ gauging the degree of political competition. Second, we test the main prediction in Proposition 1 – that greater political competition improves economic policy. A more specific prediction is that the effect of $\kappa$ should be non-linear reflecting the three cases in the Proposition. We can also test the prediction that the effect of $\kappa$ arises from political competition rather than the party in power.

# 3 Historical Background and Data

## 3.1 Historical Background

While the United States has been a vibrant democracy since its foundation, it has experienced substantial variation in the degree of political competition. During our period of interest, many states have seen long periods of substantial Republican majorities in elections. Vermont, for example, was dominated by the Republican Party for over a century until the 1960s. In this period, Republicans controlled virtually all state-wide offices and were frequently elected with over 70 percent of the vote.

However, the most dramatic departure from competitive elections has been a virtual monopoly of the Democratic Party in many states of the US south for much of the period from the 1900s until the mid 1960s.[7] In the remainder of this subsection, we discuss the changes in political competition in the south and how they can be seen through the lens of our model.

After the end of the civil war in 1865 blacks for the first time enjoyed civil and voting rights. The 14th amendments to the constitution (ratified in 1868) formalized civil rights irrespective or race and the 15th amendment (ratified in 1870) stipulated

> "the right of citizens of the United States to vote shall not be denied or abridged by the United States or by any State on account of race, color, or previous condition of servitude".

With the withdrawal of the last northern troops in 1877, however, the southern states quickly eroded the newly gained civil rights of blacks. The passage of Jim Crow laws imposed racial segregation on many aspects of public life ranging from schools, over parks and public libraries, to burial grounds.

Kousser (1974) documents how the vigorous political competition in the US south in the 1870s started to decline during the 1880s and 1990s. While the Democratic party had gained control of all state governments in the south by the 1880s, effective opposition to the Democratic party only ends with the introduction of various voting restrictions, notably literacy tests and poll taxes, during the second half of the 1890s and early 1900s. These restrictions resulted in immediate and sharp reductions in election turnout of black and poor white voters – which constituted the power base of southern Republicans all the way up to the 1960s – and effectively eliminated any serious opposition the Democratic party in the south. The sharp downturn in political competition in the US south around this time is clearly visible in our specific measure of political competition in Figure 1.

The Democratic party maintained its monopoly on power in the US south essentially unchallenged until the 1960s. The civil rights movement of the 1950s and 1960s, which culminated in the Civil Rights Act of 1964 and the

[7] See, *inter alia*, Wright (1987, 1999), Key (1950) and Davidson and Grofman (1994) for an extensive analysis of the US south.

1965 Voting Rights Act re-introduced political competition in the US south.[8] The 1965 Voting Rights Act gave the Attorney General authority to appoint federal examiners to oversee voter registration in states, or counties, using literacy or qualification tests and where less than 50% of the voting age population had voted in the 1964 presidential election. He could also seek legal action against poll taxes as a prerequisite for voting in state elections, and the Supreme Court ruled such usage illegal in a 1966 decision, which became directly binding on Alabama, Mississippi, Texas and Virginia.[9] The elimination of voting rights restrictions induced a sharp increase in turnout and triggers a step increase in political competition, which is clearly visible in Figure 1.[10]

The set of political changes that took place in the south over this period are quite complex. In our simple model, we can interpret these changes through the derived parameter $\kappa$, which is determined by voter preferences and the composition of the electorate into partisans and swing voters.[11] It is a non-trivial task to validate such changes from independent sources. The best source is probably the data in the biannual National Election Studies (NES), available from 1952 to 2002.[12] The number of respondents in each NES cross-section is quite small, at most 1500 in total, so it does not allow us to reliably single out voters in individual states, let alone subdivide by race. With this caveat, Figure 2 graphs an estimate of political competition $\kappa$ for the south and non-south over the 50 years of available surveys.[13] The change

[8] See Mackaman (2005) for a concise historical account of the political events that led to the passing of the 1965 Voting Rights Act.

[9] *Harper v. Virginia State Board of Elections* (1966). South and North Carolina, Louisiana, Georgia, Florida, Arkansas, and Tennessee had abolished their poll taxes at an earlier date.

[10] Davidson and Grofman (1994), Black and Black (2003), and Vallely (2004) give detailed accounts of how the Voting Rights Act changed southern politics with regards to minority representation and the Democratic stronghold on power.

[11] This contrasts with a view that sees changes in party preferences as the prime driving force of political change over the period.

[12] See http://www.umich.edu/~nes/

[13] The parameter $\kappa$ is estimated as follows. Respondents in the NES are classified as Republican if variable VCF0301 ("Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or what?") is 6 (weak Republican) or 7 (strong Republican), as Democrat if 1 (strong Democrat) or 2 (weak Democrat), or as swing voters if 3 (independent closer to the Democratic Party), 4 (independent closer to neither party), or 5 (independent closer to the Republican Party). We calculate the proportion of each type in every state and year as the ratio of the number of Republicans/Democrats/swing

of $\kappa$ in the south is particularly pronounced during and after the 1960s. This change is, in part, due to a rise in the share of swing voters ($\sigma$ in the model), as well as a fall in the share of partisan Democrats less partisan Republicans ($\lambda$ in the model). The value of $\kappa$ estimated from the NES is thus fully consistent with the claim that southern competition increased drastically from the 1960s. Most importantly the pattern of political competition that emerges from the calibration is very similar to our main empirical measure of political competition that we graph in Figure 1 and define in the next subsection.

## 3.2 Data and Measurement

Our key explanatory variable is a measure of political competition in each of the continental U.S. states over time. To construct that measure, we use a data set originating in the work of Ansolabehere and Snyder (2002), who collected election results for a broad set of directly elected state executive offices, ranging from U.S. representatives, over the governorship, to down-ballot officers, such as Lieutenant Governor, Secretary of State, Attorney General, etc.[14] The data set reports the average vote share of the Democrats in all-state wide races in state $s$ at time $t$, which we denote $d_{st}$.

Our theory suggests that we should measure (the lack of) political competition by the dominance of either the Democratic or Republican party in state-wide elections. We thus define $\kappa_{st}$ as the party-neutral measure

$$\kappa_{st} = -|d_{st} - 0.5| \ . \tag{5}$$

Because of the minus sign, higher values of this variable correspond to states and periods with more political competition. The variable $\kappa_{st}$ has a dis-

voters to the total number of respondents (excluding those with a missing value) each year. (The sum of the three percentage points is not equal to a hundred as some respondents are categorized as apolitical (their variable VCF0301 is 9)). Our estimate of $\kappa = -\frac{(1-\sigma)\lambda}{2\sigma\phi}$ is then computed as follows. We take the proportion of Democrats less the proportion of Republicans, i.e., $(1-\sigma)\lambda$, and divide by the proportion of swing voters, i.e., $\sigma$. We then calibrate $\phi$ to a constant which implies a 1952 winning probability of 90% for the Democrats in the South, i.e.,

$$\frac{1}{2} - \kappa = 0.9 \ .$$

which implicitly normalizes $\xi = 1$.

[14] We are very grateful to Jim Snyder for sharing an updated and expanded version of this dataset with us.

tribution heavily skewed to the right: while we have about 160 state-year observations with political competition lower than $-0.4$, we have about 2400 observations with competition between $-0.1$ and 0.[15]

To measure the policy stance of the state government ($\tau$ in the model), we use three main variables: the share of total state tax revenue in personal income, the share of capital spending in total state spending, and an indicator variable whether or not a state has a right-to-work law. Reductions in the tax burden and increases in the share of capital expenditure (as a proxy for infrastructure spending) are policies which are widely believed to be conducive to promoting economic development. Right-to-work laws make it illegal to demand that employees join a union, or to automatically deduct union fees from wages. Holmes (1998) documents that Right-to-Work laws appear to have strong effects on the location choices of business across state borders.

To explore whether political competition not only affects policy choices, but also economic growth (as in the model), we use the growth rate of state personal income as an alternative dependent variable. Closely related is the share of non-farm income in total personal income of the state, as a measure of structural change. To investigate whether our results are indeed due to changes in political competition rather than policy differences between the Democratic and Republican party, we use an indicator variable of the governor's party affiliation and the party composition of the state upper and lower houses to create indicator variables whether any one party controls both chambers of the state legislature.[16]

As discussed further below, our measure of political competition is not necessarily exogenous to the outcome variables. We therefore use the federal intervention in the US south via the 1965 Voting Rights Act as an additional source of exogenous variation. For this purpose we construct a variable, which is equal to the share of the state population subject to either a literacy test or a poll tax (or both) that attracted the attention of the 1965 Voting Rights Act. Prior to 1965 this variable is equal to one in Alabama, Georgia, Louisiana, Mississippi, South Carolina, Texas, Virginia and equal

[15] Most states have statewide election in every other year or every four years. We linearly interpolate our index of political competition for year in which no statewide elections take places.

[16] These data were previously used in Dal Bó et al. (2007) and we are grateful to Ernesto Dal Bó for sharing the data with us.

to 0.4 and 0.034 in North Carolina and Arizona respectively.[17] As mentioned above, these voting rights restrictions were introduced around the turn of the last century. The Data Appendix provides detailed sources for each of our variables. Table 1 reports (conditional) means and standard deviations for the main variables we use to establish the empirical results in the next section.

# 4 Empirical Strategy and Results

We discuss the empirical results in two parts. First, we look for the predicted effect of political competition on policy. In a second step, we investigate whether there is also a reduced form link between political competition and growth.

## 4.1 Policy

The crucial mechanism highlighted by Proposition 1 is that political competition changes the incentives of politicians to implement growth-promoting policies. In particular our theoretical model suggests that increases in political competition should make policy choices more pro-business. To examine this link empirically we estimate regressions of the form

$$\tau_{st} = \theta_s + \upsilon_t + \delta \kappa_{st} + \varepsilon_{st} \ , \tag{6}$$

where $\tau_{st}$ is a measure of the policy stance in state $s$ at time $t$ and $\theta_s$ and $\upsilon_t$ are state and year fixed effects, respectively. We estimate robust standard errors adjusted for clustering at the state level. As mentioned in the data section, we consider three different measures for $\tau_{st}$: total state tax revenue as a share of personal income, the share of capital outlays in total state expenditure, and whether a state has a Right-to-Work law. Below we also consider specifications which add a number of additional control variables to (6) and instrument for political competition.

Columns (1), (4) and (7) of Table 2 contain estimates of our basic specification (6) for our three policy measures. We find that strong political competition is indeed associated with pro-business policy choices. In particular, increases in political competition reduces state tax revenue as a share of

[17] A very similar strategy has previously been used by Husted and Kenny (1997).

personal income, increase the share of capital spending in total state spending and also increase the probability that a state has a right-to-work law.

The remaining columns of Table 2 consider two alternative econometric specifications. The large-scale changes in political competition in the US south have clearly been associated with other important changes in the southern economy and society which could be correlated with policy choices. To capture these wider changes in a non-parametric way we include interactions between the time dummies and an indicator variable for the 16 southern states as defined by the U.S. Census. Columns (2), (5) and (8) show that our estimates of the impact of changes in political competition are very similar in this alternative specification, where we only exploit variation within the south.

The final set of regressions in Table 2 address the possibility of reverse causation from policy choices to the degree of political competition. To minimize such endogeneity, which would plausibly bias our estimates downwards, we instrument political competition with the exogenous intervention of the federal government in southern politics through the 1965 Voting Rights Act. In particular, we instrument political competition with the share of the state population subject to either a literacy test or a poll tax (or both) that attracted the attention of the 1965 Voting Rights Act.[18] Columns (3), (6) and (9) of Table 2 show that the IV estimates are indeed somewhat larger than our OLS estimates and highly statistically significant.

Our estimates are not only statistically significant, but also economically important. The OLS estimate of the impact of political competition on taxes, e.g., suggests that an increase in political competition by about 0.3 – a typical variation in political competition in many southern states over the last century – reduced the share of state tax revenue in income by about 1 percentage point relative to a sample mean of 5.7 percent.

Table 3 investigates three additional implications of our theoretical model. Our model predicts that policy choices are shaped by the degree of political competition rather than party preferences. While our results so far are consistent with this view, an obvious alternative explanation of our findings

[18] The IV-strategy also addresses another possible bias in the estimate of $\delta$. Our empirical measure of political competition fluctuates substantially from one election to the next and these short-run fluctuations will poorly approximate the underlying degree of political competition, which our model emphasizes. The IV strategy relying on once-and-for-all removals of voting restrictions would remove the downward bias associated with such measurement error.

could be different policy preferences between Democrats and Republicans. Particularly the period of increasing political competition in the US south has also been a period of increased Republican representation among state governors and legislators.

Columns (1), (4) and (7) of Table 3 include our measures of the party affiliation of the governor and indicators for which party controls both houses of the state legislature. While these control variables have point estimates which are consistent with commonly held views about the Democratic and Republican party, our estimates of the impact of political competition are quantitatively very similar to our previous estimates and remain statistically significant. As a further robustness test, we have also created a separate dummy variable for the Democratic party in the US south before 1965. However, also with these additional regressors (results not shown) the effect of political competition on policy choices remains quantitatively very similar and statistical significant.

The second and related implication of our theoretical model is that both parties change their policy stance in the same way if they are the dominant party. To examine this property of the model we create separate variables for the impact of political competition on Democratic and Republican governors, which are included in columns (2), (5) and (8) of Table 3.[19] While we cannot reject that the impact of political competition is the same for Democratic and Republican governors, we find that the impact on Democratic governors is estimated substantially more precisely and also tends to be quantitatively more important.

Third, we take seriously the prediction of our model that political competition has a non-linear effect. According to Proposition 1, we should see small effects on policy both at very low and very high levels of competition. Instead, the main impact should occur at intermediate levels of political competition, when the dominant party starts improving its policy stance. Columns (3), (6) and (9) of Table 3 explore this issue. Specifically, we create binary indicators for values of political competition larger than $-0.10$,$-0.25$, and $-0.4$, respectively, and include these, rather than the continuous measure of political competition in our standard specification. Thus, the estimated effect of a change in political competition from below $-0.4$ into the range $-0.10$ to $-0.25$, for example, is the *sum* of the coefficients on the last two

[19] We drop the small number of observations with independent governors from these regressions.

indicator variables. The results show that the effect of political competition indeed appears to be non-linear. Quantitatively, the largest policy changes due to greater competition typically come about when competition exceeds $-0.25$.

As a final robustness check, Table 4 re-estimates the specification in Columns (1), (4) and (7) of Table 3 separately for the states in the US south and US north. The results show that with the exception of right-to-work laws, which seem to be mainly driven by the variation in the US south, the estimates on both subsamples are surprisingly similar. This further strengthens the conclusion that the association between political competition and economic policies is not an artefact of any particular estimation method and historical episode, but is a robust result across a number of different identification approaches and samples.

Taken together, these results support our theory that increased political competition has substantial effects on policy choices and promotes the implementation of policies that are widely believed to promote economic growth.

## 4.2 Growth

We now turn to the question whether the effects of political competition on state policies extend to measurable changes in economic performance. In the absence a fully structural model, which would allow us to identify the impact of a range of policies on economic performance, we take the more modest approach of exploring whether there is a reduced-form relationship between economic growth and political competition.

Following (1) and (6), we estimate the relationship between political competition and economic growth with a standard growth regression of the form[20]

$$g_{st} = \theta_s + \upsilon_t + \beta y_{st-1} + \delta \kappa_{st} + \varepsilon_{st} \ , \tag{7}$$

where $g_{st}$ is the annual growth rate in state $s$ at time $t$, $\theta_s$ and $\upsilon_t$ are state and year fixed effects, and where $y_{st-1}$ is the usual convergence term allowing for Solow-style convergence of per capita income with $\beta < 0$ indicating income convergence.[21] Our key regressor of interest is again our measure of political

[20]For an early discussion of panel growth regressions see Caselli et al. (1996).

[21]There are well-known econometric issues with dynamic panels that include state fixed effects, but the large number of time periods (in most specifications 72) makes us confident that any such bias is of small order. We return to this issue below.

competition $\kappa_{st}$ and we want to test whether $\delta > 0$, i.e. stiffer political competition raises the growth rate of state income.

Column (1) of Table 5 reports the results of OLS estimates of (7) on our basic data set which runs from 1929, the first year for which Census estimates of state personal income are available, to 2001. Consistent with the model predictions, we find a positive association between political competition and growth, which is statistically significant at conventional levels. These results hold up when we include south-year interactions in Column (2) and when we instrument political competition with the federal interventions to eliminate voting restrictions in columns (3) and (4). Again, the effect we find is not only statistically significant, but quantitatively important. The estimate in column (1) implies, for example, that an increase in political competition from $-0.3$ to zero, which would be typical for many southern US states over the last century, raised long-run personal income per capita by about 15 percent.[22]

Table 6 collects a number of additional results on the link between political competition and growth. Columns (1) through (3), show that – as in Table 3 – the effect of political competition is robust to controlling for party representation and non-linear as suggested by our theory. The striking similarity between the pattern of results in the growth regressions and our policy regressions adds further support to the view that the mechanism that is driving our results is indeed that political competition induces a shift towards pro-growth policies.

It might be tempting to believe that the effect that we are identifying comes exclusively from southern states. In columns (4) and (5) of Table 6 we estimate the growth regressions separately for the states in the US north and US south similar to the exercise in Table 3. While the estimates are too imprecise to reach statistical significance at conventional levels, the effect of political competition is again positive and of similar magnitude in both subsamples. In column (6), we look at five-year averages of growth, which allows us to smooth out some of the short-term volatility in income. The results are broadly robust with higher growth again being associated with greater political competition. Column (7) investigates the possible bias of estimating these five-year growth rates with state fixed effects in the presence of a lagged dependent variable. Here, we use the Arellano and Bond GMM

[22]Note that the long-run effect of political competition on income implied by the estimates obtained from (7), is given by: $-\delta/\beta$.

1st difference estimator, as recommended by Caselli, Esquivel and Lefort (1996). The specification uses one additional lag of income as an instrument for the lagged dependent variable. We again find very similar results.

The theory is based on the idea that greater political competition changes policy so as to allocate resources away from the traditional sector. A reasonable interpretation of the identity of the traditional sector, particularly in the US south, is agriculture. To test this prediction, we thus use the share of non-farm income in state income as the left hand side variable. Column (8) in Table 6 shows that political competition is indeed strongly positively associated with the share of non-farm income in total income.

While 1929 is the first year for which Census estimates of state personal income are available, there are widely used estimates of state personal income by Easterlin (1960) for the years 1880, 1900 and 1920.[23] As illustrated in Figure 1, this was a period in which political competition in the US south declined sharply. A key attraction of the 1880-1920 period is that potentially important omitted variables that may confound our growth estimates for the 1929-2001 period are unlikely to be relevant during this period. For example, the spread of air conditioning from the early 1920s until the 1960s and rapid technical progress in southern agriculture are likely to have contributed to economic growth after 1920 and could be correlated with political competition.[24] Similarly, while the improvement in race relations after the civil rights movement may have directly contributed to economic development, race relations were relatively unchanged over much of the period from 1880 to 1920.[25]

Table 7 displays our estimation results from this early period. We regress average annual growth over the two 20-year periods against the same covariates as in Tables 5 and 6 (measured as averages over each period). In this extremely short panel, we are unable to include state fixed effects, as this

[23] The methodology and data sources behind these estimates differs from the modern estimates and it is therefore not sensible to pool these early income estimates with the later Census estimates.

[24] See, for example, Arsenault (1984) for an historical account of the spread of air conditioning and Mitchener and McLean (2004) for an assessment of the importance of air conditioning for southern productivity relative to other factors. Caselli and Coleman (2001) document the importance of technological progress in the agricultural sector for the convergence of the US south.

[25] Logan (1954) analyses the rise in open racism in the US south after the end of the reconstruction and argues that the turn of the last century was probably the low point of race relations in the US south.

would substantially bias the results in the presence of a lagged dependent variable. Column (1) shows that the correlation between political competition and economic growth reported in Tables 5 and 6 holds up in the early sample. In column (2), we find that the same is true when we include a dummy for the southern states and south-year interactions. Columns (3) and (4) show that also in this case the effect of competition effect is distinct from party representation. Columns (5) and (6) show that the results hold up when we look separately at southern and northern states, respectively.

Taken together, these results suggest that changes in political competition not only change state policies, but also have a quantitatively important impact on economic growth.

# 5 Concluding Comments

This paper develops a simple model to illustrate the logic behind why greater political competition can lead to the adoption of pro-growth policies. We then present evidence to substantiate this proposition using data on US states. Using a measure of competition suggested by the theory, we show that increases in political competition are associated with lower tax revenue as a share of state income, a higher level of capital spending as a share of total state spending and a higher probability that a state uses a right-to-work law. These results are robust across a variety of specifications and subsamples of our data. Moreover, the relationship appears to be non-linear as the model implies. The changes in policy that we document also seem to affect overall state economic performance with greater political competition being associated with higher growth rates of state personal income per capita.

While our evidence is for a specific context, it supports a common theme in political economics. Throughout our sample period, the US states were well functioning democracies. But lopsided competition in some states and particular subperiods meant that policies could be tailored to vested interests rather than the entire population, resulting in stagnant growth. That a break-down of monopoly power in politics has significant consequences for policy and growth is a lesson that should have wider significance.

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# 6 Theory Appendix

## 6.1 Proof of Proposition 1

We begin by proving:
**Lemma A1:** *An equilibrium exists.*
**Proof:** If $-\kappa \geq \frac{1}{2\xi} + \overline{v} - \underline{v}$, then $1 + T_v(v_D^*) = 0$ or $v_D^* = \underline{v}$ and existence is trivial. Hence, suppose that $-\kappa < \frac{1}{2\xi} + \overline{v} - \underline{v}$. Define $f(x)$ for $x \in [\underline{v}, \overline{v}]$ from:

$$\begin{aligned} -\left[\frac{1}{2} - \xi\left[-\kappa + x - f(x)\right]\right]&\left(1 + T_x(f(x))\right) \\ &+\xi\left[\Delta + \left(f(x) + T(f(x))\right) - x\right] = 0 \ . \end{aligned}$$

Observe that $f(x) > \underline{v}$ for all $x \in [\underline{v}, \overline{v}]$ since $1 + T_v(\underline{v}) = 0$. Now, let:

$$v_R(x) = \begin{cases} \overline{v} & \text{if } f(x) > \overline{v} \\ f(x) & \text{for } f(x) \in (\underline{v}, \overline{v}] \ . \end{cases}$$

As $v_R(x)$ is everywhere continuous on $[\underline{v}, \overline{v}]$, so is:

$$H(x) = \left[\frac{1}{2} + \xi\left[-\kappa + x - v_R(x)\right]\right]\left(1 + T_x(x)\right) + \xi\left[\Delta + \left(x + T(x)\right) - v_R(x)\right] \ .$$

It is straightforward to check that $H(\underline{v}) > 0$. Now, consider:

$$\begin{aligned} H(\overline{v}) &= \left[\frac{1}{2} + \xi\left[-\kappa + \overline{v} - v_R(\overline{v})\right]\right]\left(1 + T_v(\overline{v})\right) + \xi\left[\Delta + \overline{v} - v_R(\overline{v})\right] \\ &\leq \left[\frac{1}{2} - \xi\kappa\right]\left(1 + T_v(\overline{v})\right) + \xi\Delta \qquad \text{by Assumption 1} \\ &< 0 \qquad \text{by Assumption 2 if } -\kappa > 0 \ . \end{aligned}$$

Since $H(\cdot)$ is continuous, there exists (by the intermediate value theorem) a $v_D^*$ such that $H(v_D^*) = 0$.■

Define

$$-\kappa_L = \frac{1}{2\xi} + \overline{v} - \underline{v}$$

as the level of $\kappa$ which guarantees victory to the Democrats in this circumstance.

**Lemma A2:** *If $\kappa \leq \kappa_L$ the Democratic party wins for sure and picks $\tau = 1$ and $v_D^* = \underline{v}$.*
**Proof:** This follows by observing that for $\kappa \leq \kappa_L$, the Democrats win for sure and hence pick their ideal policy.■

Now define:

$$-\kappa_H = -\kappa_L + \frac{\Delta}{(1 + T_v(\bar{v}))} \; .$$

**Lemma A3:** *For $\kappa \in (\kappa_L, \kappa_H)$, $\underline{v} < v_D^* < \overline{v} = v_R^*$.*
**Proof:** First, we show for all $\kappa < \kappa_H$, the Republicans will pick $v_R = \overline{v}$. To see this, observe that at $v_R = \overline{v}$ and $v_D = \underline{v}$, the change in the payoff of the Republican party from a small increase in $v$ is:

$$\begin{aligned} \left[\frac{1}{2} - \xi\left[-\kappa + \underline{v} - \overline{v}\right]\right](1 + T_v(\bar{v})) + \xi\left[\Delta + \overline{v} - \underline{v}\right] &> \\ \left[\frac{1}{2} - \xi\left[-\kappa_H + \underline{v} - \overline{v}\right]\right](1 + T_v(\bar{v})) + \xi\Delta &= 0 \end{aligned}$$

from the definition of $\kappa_L$. Moreover, Assumption 1 implies that this inequality holds for all $v_D > \underline{v}$.

Second, we show that it is optimal for the Democrats to pick $v_D^* < \overline{v}$. Suppose not, such that $v_D = \overline{v}$. Then, a small increase in $v_D$ alters the Democratic payoff by:

$$\left[\frac{1}{2} - \xi\kappa\right](1 + T_v(\bar{v})) + \xi\Delta < \frac{(1 + T_v(\bar{v}))}{2} + \xi\Delta < 0 \; ,$$

where the last inequality follows from Assumption 2. Thus, the best response for the Democrats must be $v_D < \overline{v}$. To see that $v_D > \underline{v}$, observe that $1 + T_v(\underline{v}) = 0$. To prove the last statement, observe that $v_D(\overline{v})$ is defined from:

$$\begin{aligned} -\left[\frac{1}{2} + \xi\left[\kappa + v_D(\overline{v}, \kappa) - \overline{v}\right]\right]((1 + T_v(v_D(\overline{v}, \kappa)))) \quad &(8) \\ = \xi\left[\Delta + v_D(\overline{v}, \kappa) + T(v_D(\overline{v}, \kappa)) - \overline{v}\right] \; . \quad &(9) \end{aligned}$$

At any point where this equality holds, $((1 + T_v(v_D(\overline{v}, \kappa)))) < 0$. Moreover, a maximum exists on $[\underline{v}, \overline{v}]$. Elementary arguments now show that, at any point satisfying (8), $v_D(\overline{v}, \kappa)$ is increasing in $\kappa$.■
**Lemma A4:** *There exists $\kappa > \kappa_H$, for which we have an interior equilibrium with $v_p^* \in (\underline{v}, \overline{v})$ for $p \in \{D, R\}$.*

**Proof:** For $\kappa = 0$, Assumption 2 implies that both parties will pick $v_p^* < \overline{v}$ for $p \in \{D, R\}$. Moreover, since strategies are continuous in $\kappa$, this holds for some $\kappa < 0$. ■

Collecting the results in Lemmas A1 through A4 above, we obtain the comparative statics as stated in Proposition 1.■

# 7 Data Appendix

*Taxation and capital spending as a share of total spending*: These variables were supplied by the Bureau of the Census in electronic format and were originally published in the annual publication *State Government Finances.*

*Right-to-Work Laws*: The spread of right-to-work laws is documented by the National Right to Work Legal Defence Foundation at http://www.nrtw.org/.

*Total personal income and the share of non-farm income*: Estimates of state personal income and its components are available from the Bureau of Economic Analysis for the period after 1929. For the period before 1929 we use the state personal income data for 1880, 1900 and 1920 from Easterlin (1960).

*Party affiliation of the governor*: This information was obtained from the National Governors Association at www.nga.org. Our indicator variable for the party affiliation of the governor is equal to one if the governor is a Democrat, equal to zero if he is a Republican and missing in the case of independents.

*Composition of state legislatures*: Information on the composition of the state upper and lower house was taken from Dal Bó et al. (2007) and was provided by Ernesto Dal Bo in electronic form. The data cover the period from 1880 to 2001 for most states.

*Voting Rights Act*: Information on the history of the voting rights act, the timing of the introduction and removal of literacy tests and poll taxes was obtained from Davidson and Grofman (1994) and Ogden (1958).